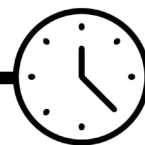


1. The lifecycle of a pet medicine



1-1 ½
hours

This activity introduces the industrial context by exploring the manufacture of pet medicine from the problem to production of the final product.

OBJECTIVES

- Asking relevant questions and using different types of scientific enquiries to answer them
- Using straightforward scientific evidence to answer questions or to support their findings
- To understand the uses and implications of science, today and for the future

RESOURCES

(Per group of 4 children, unless otherwise stated)

- Activity sheets 1-4 (Sheets 1 and 4 need to each be made into a set of cards; Activity sheet 3 enlarged to A3 or copied on to flipchart paper, sheet 2)
- One soft toy dog¹ or photograph of a dog
- Scissors
- Glue stick

INTRODUCING THE ACTIVITY

Show the children a soft toy dog, or show a photograph of a dog as a stimulus, and ask which children have pet dogs. Explain that this dog is not feeling very well.

Ask the children to discuss in groups their own experiences of having an ill pet. Ask what they would do, including where they would take it and what would happen next. You may give them the following questions as discussion prompts.

- *What could a vet do to help?*
- *How would the vet find out what is the matter with the pet?*

The vet would ask the owner questions to identify the pet's symptoms. The owners would answer questions on behalf of their pet having observed their pet for abnormalities and unusual behaviour.

- *What sort of things may the owner have noticed, that will help the vet to work out what is wrong?*

The owner would look for any marks, lumps, loss of fur, cuts, sores or changes in behaviour. This may include loss of appetite, being sick, changes in their toilet habits, withdrawn or aggressive behaviour etc. The vet would then consider the symptoms, use them to find out what the illness is and prescribe the right medicine to cure the illness.

¹ If you have Discovery Dog or Naughty Nora in school, you may wish to use one of them. Visit www.millgatehouse.co.uk or www.lancsngfl.ac.uk for further information.

MAIN ACTIVITY

In each group, one child takes on the role of a vet and 3 others are pet owners. The groups' discussions could be initiated by one sample role-play in front of the whole class. Cut out and distribute the cards (Activity sheet 1) among the 'pet owners'. The 'vets' have a copy of the branching key (Activity sheet 2). The pet owners then describe their pet's signs of illness to the vets. The vets then use the information with the key to identify the illness. Discuss the outcomes of this task with the class.

Read the final information on Activity sheet 2 to explain what happens if the medicine does not work well. [Appendix 1](#) has detailed information.

PLENARY

Explain that the children will now take on the role of scientists in a medicine company who are researching a more effective medicine for the dog's illness.

Use the enlarged version of Activity sheet 3 and the cards from Activity sheet 4 to explain to the class that they are going to model the development cycle of a new pet medicine. Talk through the process, and read each card out to the class in turn. The children then decide where to place or stick each card on the sheet.

The importance of scientists in all aspects of this process should be emphasised wherever possible. Key questions to aid this discussion are:

- *What do you think 'active ingredient' means?*
- *Why do scientists need to do lots of tests on the medicine before it is finally made?*
- *What different tests do you think scientists need to do?*
- *Why do you think different medicines are made in different forms, e.g. tablet, liquid, spray, etc.?*

Appendix 1: Further information for teachers about the industrial process

LIFECYCLE OF A PET MEDICINE

Medicine companies go through formation and development when producing new medicines. Human medicines can take around 12 years, at costs of up to £550 million. This timescale and cost is less for pet medicines, but can take even longer for medicines for farm animals. This process is nicknamed the 'lifecycle of a medicine' and this is the first thing that the children consider in Activity 1 of the unit. The 'lifecycle of a medicine' involves the following processes: it starts with the problem of an animal disease or a situation where existing medicines have limited success. Then existing medicines are researched and tested and the effects analysed. From this, active ingredients are found and developed into a dosage. This may involve fermentation and the growth of microbes, or the active ingredient may be extracted from other materials. The correct dosage is developed and is then tested on animals. When the effects have been analysed, it moves onto the formulation process. Here, the form of the medicine is decided (e.g. syrup, tablet, patch, intravenous liquid, spray etc.) and developed as a pilot scale manufacture. It is then tested in quality control to ensure the right yield, purity etc. The final stage of the process is the full scale manufacturing of the medicine. This involves mass production, packaging, marketing and distributing.

ANSWERS FOR ACTIVITY SHEET 3

1. Problem

There is no medicine to treat or stop a disease, or the medicine is not working well enough. The vet contacts a medicine company.

2. Test other medicines

The medicine company tests other medicines that cure similar illnesses. They need to find out which active ingredient works the best.

3. Make new medicine and work out the best amount and way to give it.

The best active ingredient is found and made. The scientists then test how much to give to the animal, and the best way to give it.

4. Make the medicine

The company decides whether to make a tablet, spray, liquid medicine or injection. The 'active' ingredient is mixed with other ingredients to make the new medicine.

5. Pilot Testing

The new medicine is tested to find out how well it cures the animal's illness. Permission is given by government scientists to make and sell the medicine.

6. Make large amounts

The medicine is made, packaged, advertised and sold to vets around the country.